

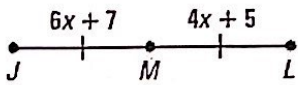
Geometry Fall Semester Final Exam Review Guide

Unit 1: Segment Relationships

Unit 1 Grade: _____

I Can Use Segment Relationships to Solve Problems.

1. M is the midpoint of JL. Find JM.



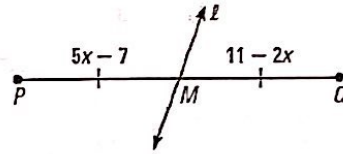
$$6x + 7 = 4x + 5$$

$$2x = -2$$

$$x = -1$$

$$\boxed{JM = 1}$$

2. Line l is the segment bisector of \overline{PQ} . Solve for x .

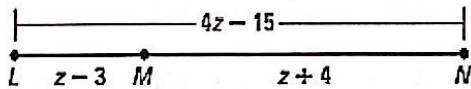


$$5x - 7 = 11 - 2x$$

$$7x = 18$$

$$\boxed{x = \frac{18}{7}}$$

3. Find the length of LN.



$$LM + MN = LN$$

$$z - 3 + z + 4 = 4z - 15$$

$$2z + 1 = 4z - 15$$

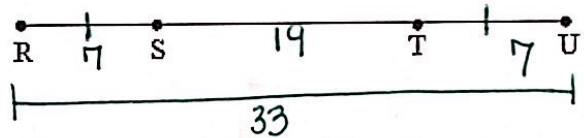
$$16 = 2z$$

$$8 = z$$

$$LM = 4(8) - 15$$

$$\boxed{LM = 17}$$

4. If $RS = TU$, $ST = 19$, $RU = 33$, find...



a) Find RS

$$33 - 19 = 14$$

$$14 \div 2 = 7$$

$$\boxed{RS = 7}$$

b) Find SU.

$$\boxed{SU = 26}$$

I Can Use and Apply Distance and Midpoint Formulas.

5. Find the length and midpoint of the points (3, 2) and (5, -2).

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$d = \sqrt{(5 - 3)^2 + (-2 - 2)^2}$$

$$d = \sqrt{(2)^2 + (-4)^2}$$

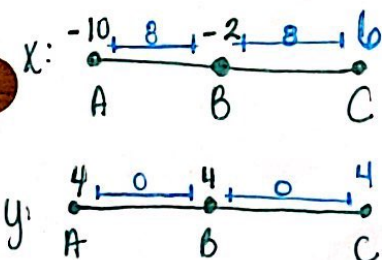
$$d = \sqrt{4 + 16}$$

$$d = \sqrt{20} \text{ or } 4.5$$

$$M = \left(\frac{3 + 5}{2}, \frac{2 + (-2)}{2} \right)$$

$$M = (4, 0)$$

6. B is the midpoint of segment AC. The coordinates of A are (-10, 4) and the coordinates of B are (-2, 4). Find the coordinates of C.



$$C = (6, 4)$$

$$\left\{ \begin{array}{l} 2 \cdot -2 = \frac{-10 + x}{2} \cdot 2 \quad 2 \cdot 4 = \frac{4 + y}{2} \cdot 2 \\ -4 = -10 + x \quad 8 = 4 + y \\ 6 = x \quad y = 4 \end{array} \right.$$

$$C = (6, 4)$$

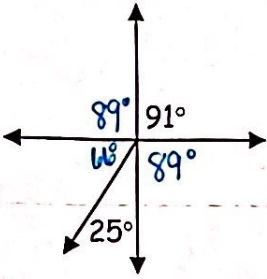
Unit 2: Angle Relationships

Unit 2 Grade: _____

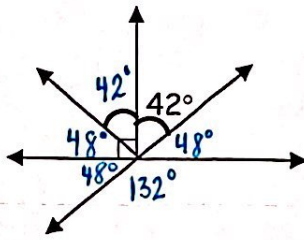
I Can Apply Angle Relationships to Solve Problems.

7. Find the missing angle measures:

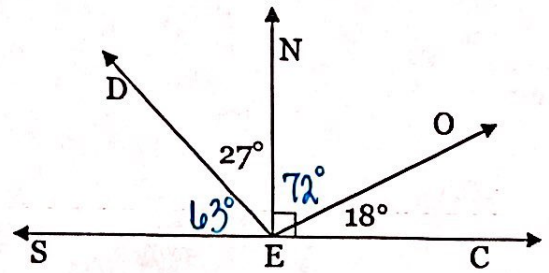
a.



b.

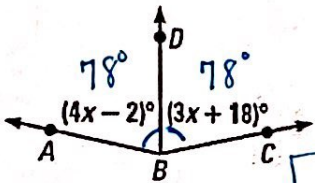


c.



8. Given that \overline{BD} bisects $\angle ABC$, find the measure of $\angle ABC$.

Angle Bisector

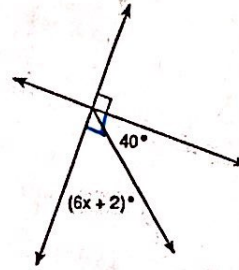


$$4x - 2 = 3x + 18$$

$$x = 20$$

$$\angle ABC = 156^\circ$$

9. Solve for x. Complementary Angles



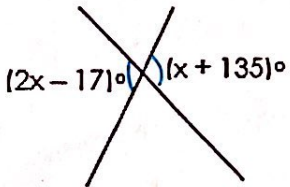
$$6x + 2 + 40 = 90$$

$$6x + 42 = 90$$

$$6x = 48$$

$$x = 8$$

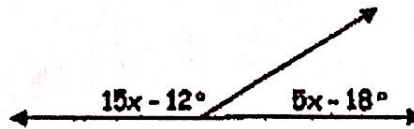
10. Solve for x. Vertical Angles



$$2x - 17 = x + 135$$

$$x = 152$$

11. Solve for x. Linear Pair



$$15x - 12 + 5x - 18 = 180$$

$$20x - 30 = 180$$

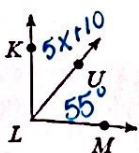
$$20x = 210$$

$$x = 10.5$$

12.

Find x if $m\angle KLM = 14x + 11$, $m\angle KLU = 5x + 10$, and $m\angle ULM = 55^\circ$.

Angle Addition



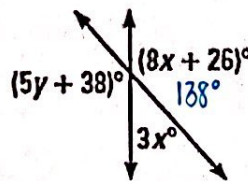
$$5x + 10 + 55 = 14x + 11$$

$$5x + 65 = 14x + 11$$

$$54 = 9x$$

$$6 = x$$

13. Solve for x and y.



$$8x + 26 + 3x = 180$$

$$11x + 26 = 180$$

$$11x = 154$$

$$x = 14$$

$$5y + 38 = 138$$

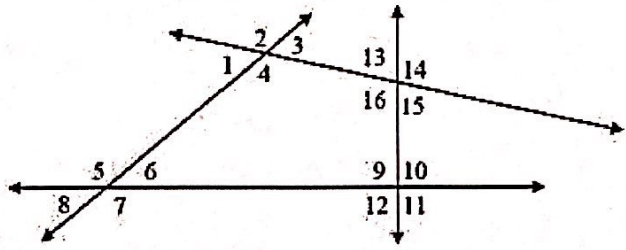
$$5y = 100$$

$$y = 20$$

I Can Use Parallel Line Relationships to Solve Problems.

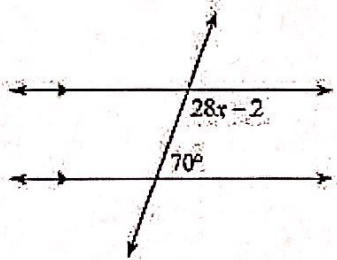
14. Refer to the figure and identify the special angle pair name.

- a) $\angle 3$ and $\angle 13$ Same Side Interior \angle 's
- b) $\angle 8$ and $\angle 10$ Alternate Exterior \angle 's
- c) $\angle 11$ and $\angle 15$ Corresponding \angle 's
- d) $\angle 8$ and $\angle 6$ Vertical \angle 's
- e) $\angle 1$ and $\angle 6$ Alternate Interior \angle 's
- f) $\angle 6$ and $\angle 10$ Corresponding \angle 's
- g) $\angle 14$ and $\angle 15$ Linear Pair



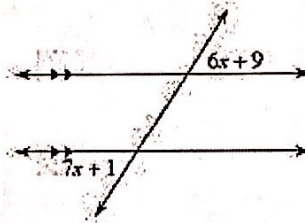
15. Identify the angle relationship you will use to solve for x . Then solve for x .

a. Same Side Int $x = 4$



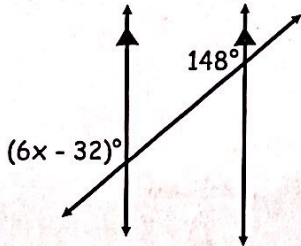
$$\begin{aligned} 28x - 2 + 70 &= 180 \\ 28x + 68 &= 180 \\ 28x &= 112 \\ x &= 4 \end{aligned}$$

b. Alt Ext \angle 's $x = 8$



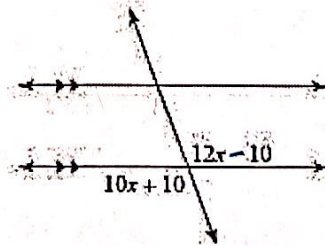
$$\begin{aligned} 6x + 9 &= 7x + 1 \\ 8 &= x \end{aligned}$$

c. Corresponding $x = 30$



$$\begin{aligned} 6x - 32 &= 148 \\ 6x &= 180 \\ x &= 30 \end{aligned}$$

d. Vertical \angle 's $x = 10$



$$\begin{aligned} 12x - 10 &= 10x + 10 \\ 2x &= 20 \\ x &= 10 \end{aligned}$$

I Can Recognize Algebraic Properties.

16. Name the algebraic property described below:

a. If $a = b$, then $b = a$

Symmetric Prop

b. If $a = b$, then $a + c = b + c$

Addition Prop

c. If $\angle A \cong \angle B$ and $\angle B \cong \angle C$, then $\angle A \cong \angle C$

Transitive Prop

d. If $a = b$, then $ac = bc$

Multiplication Prop

e. $a = a$

Reflexive Prop

I Can Create a Proof Using Algebraic Properties.

17. Given: $a + b = c$
 $c = 7d$
 $a = b$

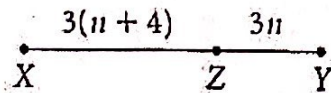
Prove: $7d = 2b$

	Statement		Reason
1	$a + b = c$	1	Given
2	$c = 7d$	2	Given
3	$a = b$	3	Given
4	$a + b = 7d$	4	Transitive or Substitution
5	$b + b = 7d$	5	Substitution
6	$2b = 7d$	6	CLT
7	$7d = 2b$	7	Symmetric Prop

I Can Create a Proof Using Algebraic Properties and Geometric Relationships.

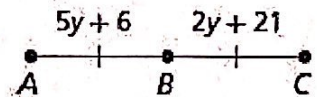
18. Given: $m\overline{XY} = 42$

Prove: $n = 5$



19. Given: B is the midpoint of AC.

Prove: $y = 5$

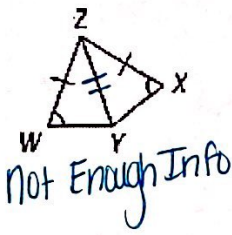


STATEMENTS	REASONS
① $m\overline{XY} = 42$	① Given
② $XZ + ZY = XY$	② Segment Addition
③ $3(n+4) + 3n = 42$	③ Substitution
④ $3n + 12 + 3n = 42$	④ Distributive Prop
⑤ $6n + 12 = 42$	⑤ CLT
⑥ $6n = 30$	⑥ Subtraction Prop
⑦ $n = 5$	⑦ Division Prop

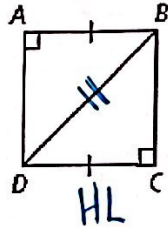
STATEMENTS	REASONS
① B is midpoint of AC	① Given
② $\overline{AB} \cong \overline{BC}$	② Def of midpoint
③ $AB = BC$	③ \cong seg \rightarrow = measures
④ $5y + 6 = 2y + 21$	④ Substitution
⑤ $3y + 6 = 21$	⑤ Subtraction Prop
⑥ $3y = 15$	⑥ Subtraction Prop
⑦ $y = 5$	⑦ Division Prop

I Can Determine if Two Triangles are Congruent Using ASA, SAS, SSS, AAS, and HL.

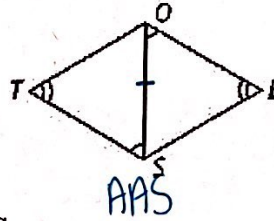
20.



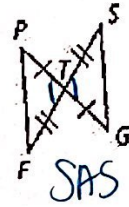
b.



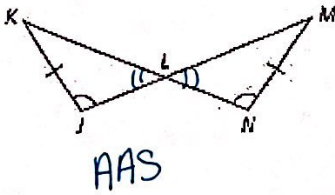
c.



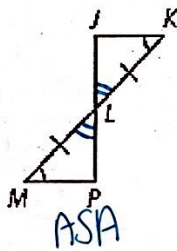
d.



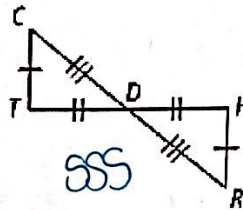
e.



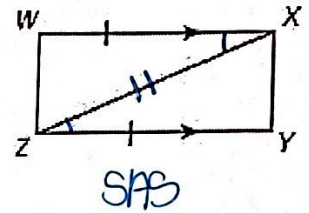
f.



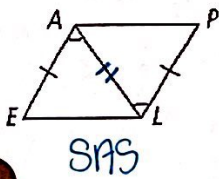
g.



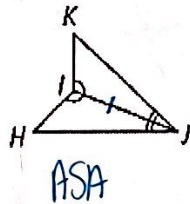
h.



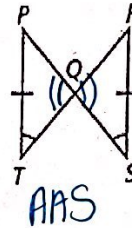
i.



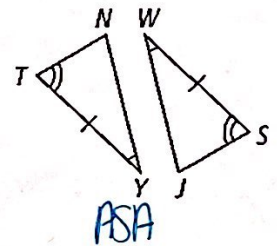
j.



k.

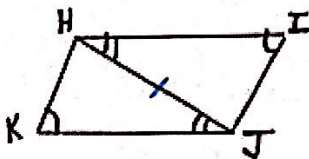


l.



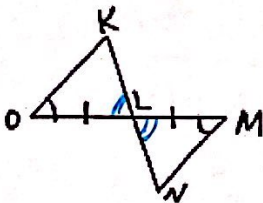
I Can Prove Two Triangles are Congruent Using ASA, SAS, SSS, AAS, HL, and CPCPTC.

21. Complete the proof below.



Statement	Reason
1. $\angle I \cong \angle K$	1. Given
2. $\angle IHJ \cong \angle KJH$	2. Given
3. $\overline{HJ} \cong \overline{HJ}$	3. Reflexive Prop
4. $\triangle HJK \cong \triangle JHI$	4. AAS

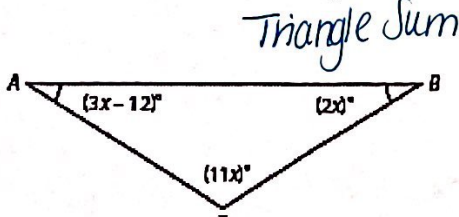
22. Complete the proof below.



Statement	Reason
1. $\angle O \cong \angle M$	1. Given
2. $\overline{OL} \cong \overline{ML}$	2. Given
3. $\angle KLO \cong \angle NLM$	3. Vertical \angle 's are \cong
4. $\triangle KLO \cong \triangle NLM$	4. ASA
5. $\angle K \cong \angle N$	5. CPCPTC

I Can Solve Problems involving Triangle Relationships (Triangle Sum, Exterior Angle, & Isosceles Base Angles).

23. Find the measure of angle A.



$$3x - 12 + 11x + 2x = 180$$

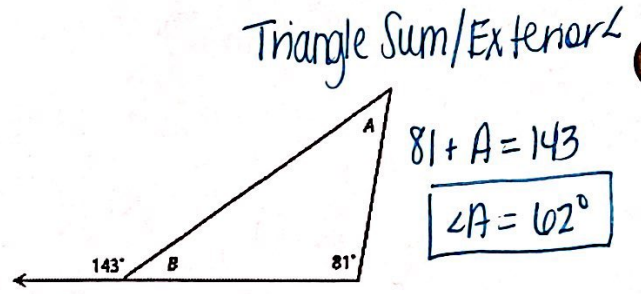
$$16x - 12 = 180$$

$$16x = 192$$

$$x = 12$$

$\angle A = 24^\circ$

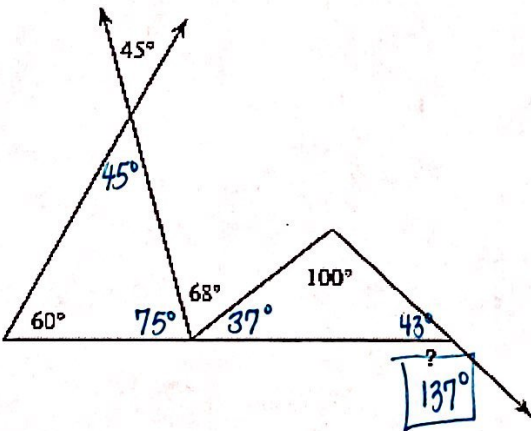
24. Find the measure of angle A.



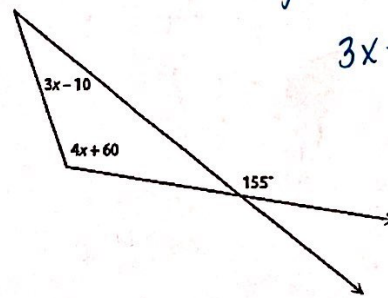
$$81 + A = 143$$

$\angle A = 62^\circ$

25. Find the measure of the missing angle.



26. Solve for x.



Triangle Sum or Exterior \angle

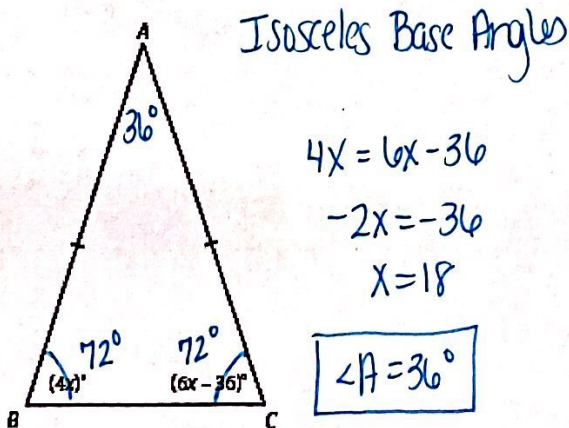
$$3x - 10 + 4x + 60 = 155$$

$$7x + 50 = 155$$

$$7x = 105$$

$x = 15$

27. Find the measure of angle A.



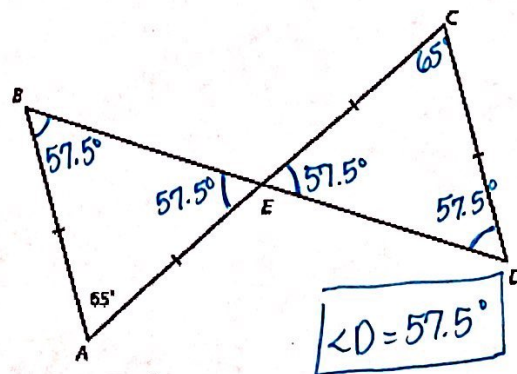
$$4x = 6x - 36$$

$$-2x = -36$$

$$x = 18$$

$\angle A = 36^\circ$

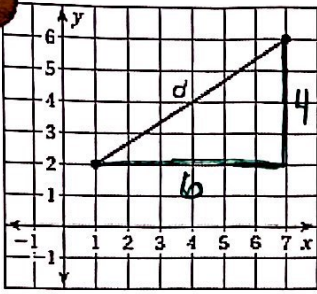
28. Find the measure of angle D.



$\angle D = 57.5^\circ$

I Can Use and Apply the Pythagorean Theorem.

29. Find the length of line d.



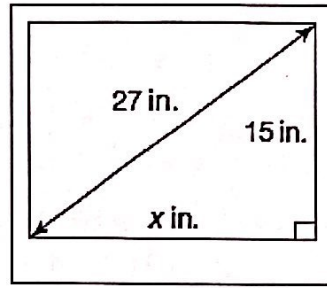
$$6^2 + 4^2 = c^2$$

$$36 + 16 = c^2$$

$$\sqrt{52} = \sqrt{c^2}$$

$$7.2 = c$$

30. Find the length of the TV.



$$15^2 + b^2 = 27^2$$

$$225 + b^2 = 729$$

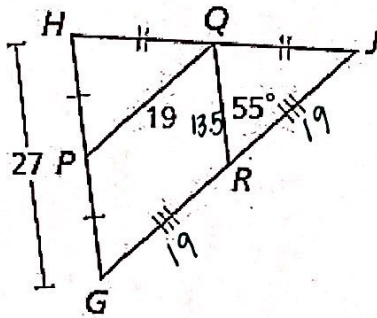
$$\sqrt{b^2} = \sqrt{504}$$

$$b = 22.4$$

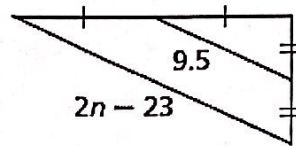
I Can Use and Apply the Triangle Midsegment Theorem.

31. Find the length of the stated sides:

- GJ = 38
- RQ = 13.5
- RJ = 19
- HP = 13.5



32. Solve for n.



$$2(9.5) = 2n - 23$$

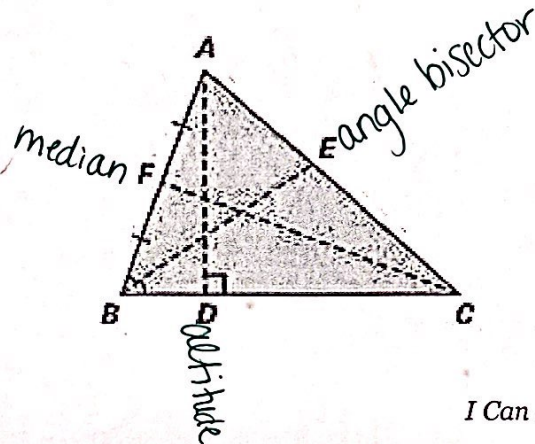
$$19 = 2n - 23$$

$$42 = 2n$$

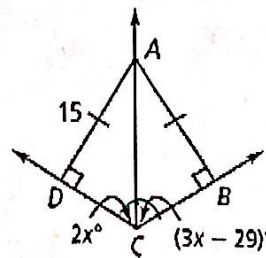
$$n = 21$$

I Can Identify Segments in Triangles and Use Them to Solve Problems.

33. Identify the dotted lines as either an altitude, Perpendicular bisector, median, or angle bisector.



34. Answer the following questions:



$$2x = 3x - 29$$

$$-x = -29$$

$$x = 29$$

x = 29

AB = 15

m∠ACB = 58°

I Can Determine if Three Sides Will Form a Triangle.

35. Determine whether you can construct a triangle with the following side lengths. Explain why or why not.

a. 6, 7, 11

$6 + 7 > 11$
 $13 > 11$ True
 Yes, two sides added together is more than 3rd side

b. 3, 6, 9

$3 + 6 > 9$
 $9 > 9$ False
 NO, sum of two sides is not greater than third side

36. What are possible lengths for the 3rd side if the two side lengths are:

10, 12

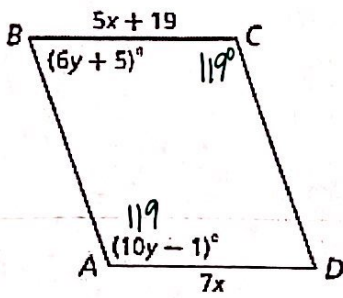
10, 12, —
 $10 + 12 > x$
 $22 > x$
 $x > 2$

—, 10, 12
 $x + 10 > 12$
 $x > 2$

$2 < x < 22$

I Can Apply Properties of Quadrilaterals to Solve Problems.

37. Name the relationship you would use to solve for x and y if you know the figure is a parallelogram. Then solve for x and y AND find the measure of angle C and side BC.



Relationship for x: Opposite sides are \cong

$x = 5x + 19 = 7x$

$19 = 2x$
 $9.5 = x$

Relationship for y: Consecutive \angle 's are supp

$y = 6y + 5 + 10y - 1 = 180$

$16y + 4 = 180$
 $16y = 176$

$y = 11$

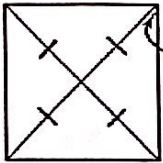
$m\angle C = 119^\circ$

$BC = 66.5$

I Can Apply Properties of Special Quadrilaterals to Solve Problems.

38. Name the property used to solve for x and then solve for x for the following special quadrilaterals:

a. Square Diagonals bisect right \angle 's

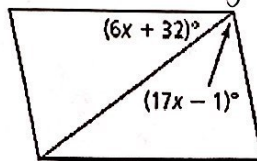


$7x + 3 = 45$

$7x = 42$

$x = 6$

b. Rhombus Diagonals bisect \angle 's

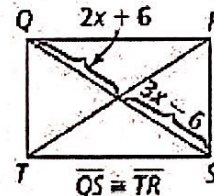


$6x + 32 = 17x - 1$

$33 = 11x$

$x = 3$

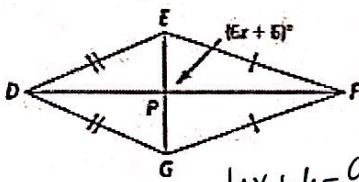
c. Rectangle Diagonals are \cong



$2x + 6 = 3x - 6$

$12 = x$

d. Kite Diagonals are perpendicular

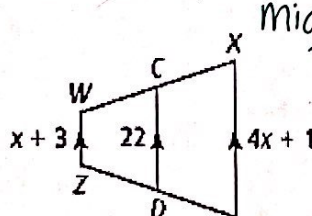


$6x + 6 = 90$

$6x = 84$

$x = 14$

e. Isosceles Trapezoid



Midsegment Theorem

$22 = \frac{1}{2}(x + 3 + 4x + 1)$

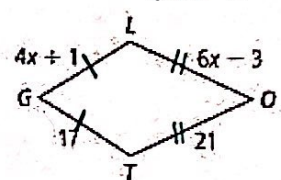
$22 = \frac{1}{2}(5x + 4)$

$22 = 2.5x + 2$

$20 = 2.5x$

$x = 8$

f. Kite Consecutive sides are \cong



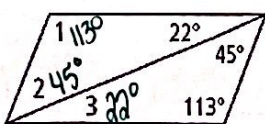
$4x + 1 = 17$

$4x = 16$

$x = 4$

39. Find the measure of all numbered angles.

a. Parallelogram

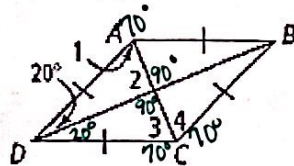


$\angle 1 = 113^\circ$

$\angle 2 = 45^\circ$

$\angle 3 = 22^\circ$

b. Rhombus



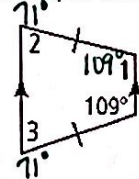
$\angle 1 = 70^\circ$

$\angle 2 = 90^\circ$

$\angle 3 = 70^\circ$

$\angle 4 = 70^\circ$

c. Trapezoid

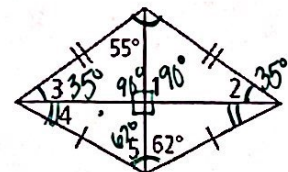


$\angle 1 = 109^\circ$

$\angle 2 = 71^\circ$

$\angle 3 = 71^\circ$

d. Kite



$\angle 1 = 90^\circ$

$\angle 2 = 35^\circ$

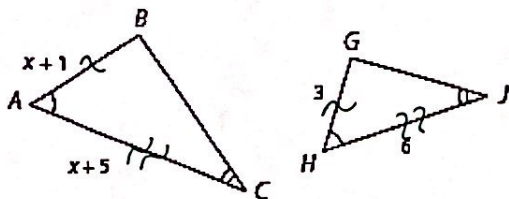
$\angle 3 = 35^\circ$

$\angle 4 = 28^\circ$

$\angle 5 = 62^\circ$

I Can Use Similar Figures to Solve Problems.

40. Find the value of x.



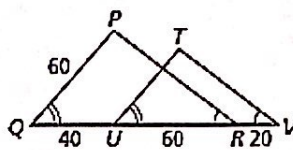
$$\frac{3}{x+1} = \frac{6}{x+5}$$

$$3(x+5) = 6(x+1)$$

$$3x+15 = 6x+6$$

$$9 = 3x \quad | \quad x = 3$$

41. Find the length of TU.

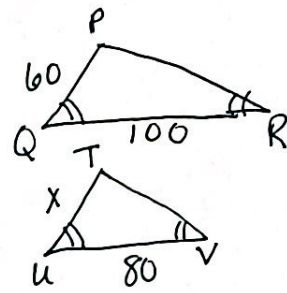


$$\frac{60}{x} = \frac{100}{80}$$

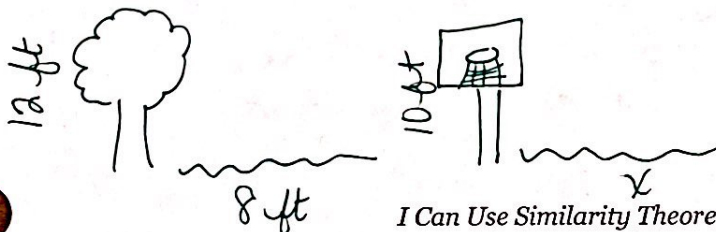
$$100x = 4800$$

$$x = 48$$

$$\boxed{TU = 48}$$



42. At a certain time of day, a tree that is 12 feet tall casts a shadow that is 8 feet long. Find the length of the shadow that is created by a 10 feet tall basketball hoop at the same time of the day.



$$\frac{12}{8} = \frac{10}{x}$$

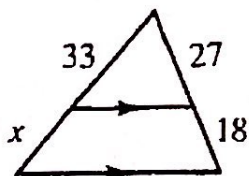
$$80 = 12x$$

$$x = 6.7 \text{ ft}$$

The basketball hoop's shadow is 6.7 ft long.

I Can Use Similarity Theorems to Solve Problems.

43. Solve for x.

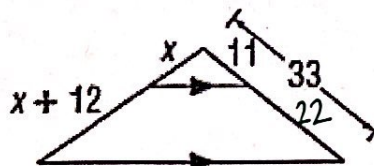


$$\frac{33}{x} = \frac{27}{18}$$

$$27x = 594$$

$$\boxed{x = 22}$$

44. Solve for x.



$$\frac{x}{x+12} = \frac{11}{22}$$

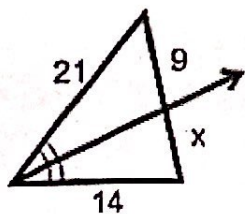
$$22x = 11(x+12)$$

$$22x = 11x + 132$$

$$11x = 132$$

$$\boxed{x = 12}$$

45. Solve for x.

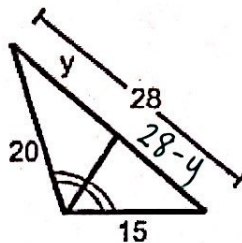


$$\frac{14}{x} = \frac{21}{9}$$

$$21x = 126$$

$$\boxed{x = 6}$$

46. Solve for y.



$$\frac{15}{28-y} = \frac{20}{y}$$

$$20(28-y) = 15y$$

$$560 - 20y = 15y$$

$$560 = 35y$$

$$\boxed{y = 16}$$